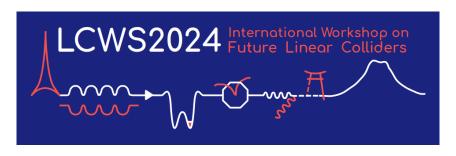
## International Workshop on Future Linear Colliders, LCWS2024



Contribution ID: 57

Type: Oral presentation (in person)

## Test-beam measurements of instrumented sensor planes for a highly compact and granular electromagnetic calorimeter

Wednesday 10 July 2024 09:30 (30 minutes)

The LUXE experiment is designed to explore the strong-field QED regime in interactions of high-energy electrons from the European XFEL in a powerful laser field. One of the crucial aims of this experiment is to measure the production of electron-positron pairs as a function of the laser field strength where non-perturbative effects are expected to kick in above the Schwinger limit.

For the measurements of positron energy and multiplicity spectra, a tracker and an electromagnetic calorimeter are foreseen. Since the expected number of positrons varies over five-orders of magnitude, and has to be measured over a widely spread low energy background, the calorimeter must be compact and finely segmented. The concept of a sandwich calorimeter made of tungsten absorber plates interspersed with thin sensor planes is developed. The sensor planes comprise a silicon pad sensor, flexible Kapton printed circuit planes for bias voltage supply and signal transport to the sensor edge, all embedded in a carbon fibre support. The thickness of a sensor plane is less than 1 mm. A dedicated readout is developed comprising front-end ASICs in 130 nm technology and FPGAs to orchstrate the ASICs and perform data pre-processing. As an alternative, GaAs are considered with integrated readout strips on the sensor. Prototypes of both sensor planes are studied in an electron beam of 5 GeV. Results will be presented on the homogeneity of the response, edge effects and cross talk between channels.

## Apply for poster award

**Primary author:** BENHAMMOU, Yan (Tel Aviv University (IL))

Presenter: BENHAMMOU, Yan (Tel Aviv University (IL))
Session Classification: Calorimetry, Muon detectors

Track Classification: Physics and Detector: Calorimetry, Muon